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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,976	09/04/2003	Kentaro Nakajima	242330US2S	4476

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EXAMINER	
TRAN, LONG K	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/653,976	NAKAJIMA, KENTARO	
	Examiner	Art Unit	
	Long K. Tran	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September04, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 4, 6-8,11,12,14-16,19,20,22,23,27,28,30,31,33,35,and 36* is/are rejected.

7)☒ Claim(s) *5,9,10,13,17,18,21,24-26,29,32,34 and 37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/04/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed on September 04, 2003.

Information Disclosure Statement

2. This office acknowledges of the following items from the Applicant:

Information Disclosure Statements (IDS) filed on December 04, 2003.

The references cited on the PTO -1449 form have been considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim **1** is rejected under 35 U.S.C. 102(e) as being anticipated by Tuttle (US Patent no. 6,429,044).

Regarding claim **1**, Tuttle discloses a magnetic memory device having a packaged magnetic memory chip, comprising:

A package structure including a magnetic guide 50 (fig. 4) of a high-permeability magnetic material, abstract and col. 4, lines 46 –49; note: Tuttle does not explicitly spell

out layer 50 is a magnetic guide, however, because the structure of Tuttle's device with a high-permeability material layer 50 similar to the magnetic guide 35 (fig. 9) of the claimed invention, therefore, layer 50 is a magnetic guide) forming a structural member of package structure 10 (fig. 4).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims **2, 3, 4, 6, 7, 8, 11, 12** and **14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (US Patent no. 6,429,044) in view of Qin et al (US Patent no. 6,020,625).

Regarding claims **2** and **3**, Tuttle discloses package 10 (fig. 4) having a lead frame 16 (fig. 4; col. 4, lines 41 – 45) on which the memory chip 12 (fig. 4), and the lead frame is made of conductive high-permeability magnetic material (col. 4, lines 21 – 61).

Tuttle does not explicitly show bonding agent and a sealing resin.

However, bonding agent and sealing (encapsulating) resin are known materials in semiconductor technology for bonding chip to a lead frame and covering a semiconductor chip as shown by Qin et al. (die bond material 10 (fig. 4) and molded resin 12 (fig. 4); col. 8, lines 15 – 19). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ a well known material in Tuttle device as taught by Qin, since it has been held to be within the general skill of a

worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claim **4**, Tuttle discloses conductive magnetic lead frame composing nickel-iron, permalloy, (col. 5, lines 4 – 8)

Regarding claim **6**, Qin discloses the inner and outer portions of the lead frame are made of copper (col. 8, lines 25 – 28).

Tuttle and Qin do not teach copper in the lead frame are plated. However this limitation is taken to be a product by process limitation, it is the patentability product and not of recited process steps which must be established. Therefore, when the prior art discloses a product which reasonably appears to be identical with or only slightly different than the product claimed in a product-by process claim, a rejection based on sections 102 or 103 is fair. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324,326(CCPA 1974); In re Marosi et al., 218 USPQ 289,292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process " claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claim in "product by process" claim or not.

Regarding claim **7**, Tuttle and Qin disclose a frame comprising a frame body 16 (fig. 5; col.4) covered with a high-permeability magnetic material film 60 (fig. 5; col. 4, lines 28 – 30).

Tuttle does not show the lead frame body comprises Cu or Fe.

However, Qin shows lead frame a copper frame die pad (co. 8, line25 –28).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the lead frame body of Tuttle with the copper frame die pad of Ohie, in order to improve the heat characteristic and lower the residual stress during the heat cycle of the device manufacturing process.

Regarding claim **8**, Tuttle and Qin disclose the claimed invention of claims 1, 2 and 7 except for the high-permeability magnetic material film is formed by plating, vacuum deposition or sputtering. However this limitation is taken to be a product by process limitation, it is the patentability product and not of recited process steps which must be established. Therefore, when the prior art discloses a product which reasonably appears to be identical with or only slightly different than the product claimed in a product-by process claim, a rejection based on sections 102 or 103 is fair. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324,326(CCPA 1974); In re Marosi et al., 218 USPQ 289,292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process " claim, and not the patentability of the process.

See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claim in "product by process" claim or not.

Regarding claim **11**, Tuttle discloses mold compound mixed with a high-permeability magnetic particulate (col. 4, lines7 – 19).

Tuttle does not explicitly show bonding agent and a sealing resin.

However, sealing (encapsulating) resin are known materials in semiconductor technology for covering a semiconductor chip as shown by Qin et al. (die bond material 10 (fig. 4) and molded resin 12 (fig. 4); col. 8, lines 15 – 19). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ a well known material in Tuttle device as taught by Qin, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claim **12**, Tuttle discloses the high-permeability magnetic particulate includes ferrite of spinel type and ferrite of garnet type (col. 4, lines 31 – 35).

Regarding claim **14**, Tuttle discloses the portion of resin 56 (fig. 4) contacted by outer lead portion of the lead frame is made of a material not containing a magnetic material, while the portion 50 is made of material mixed with high-permeability magnetic material particulates (col. 4, lines 49 – 61).

7. Claims **15, 16, 19, 20** and **16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (US Patent no. 6,429,044) in view of Ohie (US Patent no. 6,580,164) and further in view of Qin et al (US Patent no. 6,020,625).

Regarding claim **15**, Tuttle discloses the claimed invention of claim 1 except for the memory chips are stacked in a multi-layer form and sealed by resin.

However, Ohie shows two memory chips are stacked in a multi-layer form.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the single chip package of Tuttle with the multi-layer chip stacked of Ohie, in order to increase the capacity of each memory and provide space saving (col. 3, line 6 – 19) and to avoid the unnecessary increasing a size used as for semiconductor device and additionally develop a lead frame (col. 8, lines 27 – 29).

In addition, sealing (encapsulating) resin are known materials in semiconductor technology for covering a semiconductor chip as shown by Qin et al. (die bond material 10 (fig. 4) and molded resin 12 (fig. 4); col. 8, lines 15 – 19). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ a well known material in Tuttle device as taught by Qin, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claim **16**, Tuttle, Ohie and Qin show each memory chip is bonded by die material and the lowest memory chip is bonded on S lead frame by a die bonding material.

Regarding claim **19**, Tuttle, Ohie and Qin show a high-permeability magnetic layer 50 (Tuttle, fig. 4) covering the stacked memory chip.

Regarding claim **20**, Tuttle discloses the high-permeability magnetic particulate includes ferrite of spinel type and ferrite of garnet type (col. 4, lines 31 – 35).

Regarding claim **22**, Tuttle discloses the portion of resin 56 (fig. 4) contacted by outer lead portion of the lead frame is made of a material not containing a magnetic material, while the portion 50 is made of material mixed with high-permeability magnetic material particulates (col. 4, lines 49 – 61).

8. Claims **23, 27, 28, 30, 31, 33, 35** and **36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (US Patent no. 6,429,044) in view of Soga et al (US Patent Application Publication no. 2002/0114726).

9. Regarding claim **23**, Tuttle discloses the claimed invention of claim 1 except for the package structure includes a heat sink, bonding agent and a sealing resin.

However, Soga shows semiconductor chip 25 (figs. 14 (a) – (c)) bonded to a heat sink 52 (figs. 14 (a) – (c)) using bonding agent, solder paste, and resin encapsulated ([0110]).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the package of Tuttle with the heat sink (thermal-diffusion plate) of Soga, in order to provide addition heat dissipation for the device.

In addition, bonding agent and sealing (encapsulating) resin are known materials in semiconductor technology for bonding chip to a lead frame and covering a semiconductor chip as shown by Soga. . It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ a well known material in Tuttle device as taught by Soga, since it has been held to be within the general skill of a

worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claims **27** and **33**, Tuttle discloses the claimed invention of claim 1 except for the package structure includes a base board, bonding agent and a sealing resin.

However, Soga shows semiconductor chip 25 (figs. 14 (a) – (c)) bonded to a base board 49, 39 (fig. 5 (b) and (c); [0085] and [0089]) using bonding agent, solder paste, and resin encapsulated ([0110]).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the package of Tuttle with the base board of Soga, in order to provide a relatively small output module used for signal-processing ([0084]).

In addition, bonding agent and sealing (encapsulating) resin are known materials in semiconductor technology for bonding chip to a lead frame and covering a semiconductor chip as shown by Soga. . It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ a well known material in Tuttle device as taught by Soga, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claim **28**, Soga discloses the memory chip is face-down bonded on the board 39 ([0089]).

Regarding claim **30**, Soga discloses the base board is made of a material containing no magnetic particulates; Tuttle shows the magnetic guide 50 (fig. 4) of a high-permeability magnetic material, abstract and col. 4, lines 46 –49).

Regarding claim **31**, Tuttle discloses the high-permeability magnetic particulate includes ferrite of spinel type and ferrite of garnet type (col. 4, lines 31 – 35).

Regarding claim **35**, Soga discloses the base board is made of a material containing no magnetic particulates; Tuttle shows the magnetic guide 50 (fig. 4) of a high-permeability magnetic material, abstract and col. 4, lines 46 –49).

Regarding claim **36**, Tuttle discloses the high-permeability magnetic particulate includes ferrite of spinel type and ferrite of garnet type (col. 4, lines 31 – 35).

Allowable Subject Matter

10. Claims **5, 9, 10, 13, 17, 18, 21, 24, 25, 26, 29, 32, 34** and **37** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an examiner's statement of reasons for the indication of allowable subject matter: Claims **5, 9, 10, 13, 17, 18, 21, 24, 25, 26, 29, 32, 34** and **37** are allowable over the prior art of record because none of the prior art whether taken singularly or in combination, especially when these limitations are considered within the specific combination claimed, to teach:

Lead frame including a metal crystal material including sendust and Finemet as cited in claim 5; lead frame comprising a frame body of Cu or Fe that covered with high-permeability magnetic material film formed of a resin paste containing a high-permeability magnetic powder as cited in claims 9 and 10; resin is mixed with a high-permeability magnetic particulate including Mn-Zn ferrite and an additive, and yttrium iron garnet and an additive as cited in claim 13; at least one of the die bonding agents (materials) contains high-permeability magnetic powder as cited in claim 17; die bonding agent comprising a sheet member having a foil member of high-permeability magnetic material located between two adhesive resin sheets as cited in claim 18; resin is mixed with a high-permeability magnetic particulate including Mn-Zn ferrite and yttrium iron garnet as cited in claim 21; the heat sink covered with a high-permeability magnetic material film functioning as the magnetic guide as cited in claim 24; the base board is made of a high-permeability magnetic material and functions as the magnetic guide as cited in claim 29; resin is mixed with a high-permeability magnetic particulate including Mn-Zn ferrite and an additive, and yttrium iron garnet and an additive as cited in claim 32; the base board is made of a high-permeability magnetic material and functions as the magnetic guide as cited in claim 34; resin is mixed with a high-permeability magnetic particulate including Mn-Zn ferrite and an additive, and yttrium iron garnet and an additive as cited in claim 37.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long K. Tran whose telephone number is 571-272-1797. The examiner can normally be reached on Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Long Tran LKT

April 7, 2005

David Nelms
Supervisory Patent Examiner
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